

Notice of Allowability

Application No.

10/623,616

Examiner

Stephen Rosasco

Applicant(s)

PARK ET AL

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to IDS 12/30/04.
2. ☒ The allowed claim(s) is/are 1-36.
3. ☒ The drawings filed on 22 July 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 12/30/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

ALLOWANCE

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

In claim 14, second paragraph, in the phrase "elements on the of the", delete "on the".

The following is an examiner's statement of reasons for allowance: the claimed invention is distinguished over the prior art of record in that the prior art does not teach a photomask and a method of making a photomask, the method comprising: providing a photomask that includes a substrate having a front side and a rear side, and a main pattern located at said front side of the substrate; quantifying the critical dimensions to obtain a distribution of values of the critical dimensions on the wafer; comparing the critical dimension values to a reference critical dimension value in order to ascertain the differences therebetween; determining, in relation to localities on the photomask, degrees to which the intensity of the illumination used in the exposure process would need to be decreased in order to reduce the differences, respectively, between the critical dimension values and the reference critical dimension value; to thereby obtain a distribution of said degrees in relation to said localities; selecting transparency-adjusting pattern features that, if provided in a set at a rear side of the substrate of the photomask during the exposure process, would change the intensity of the illumination passing through the photomask during the exposure process due to the density of the features in terms of their size and spacing; obtaining a correlation between the densities of the transparency-adjusting pattern features, in terms of their size and spacing, and the changes that the transparency-adjusting pattern features

Art Unit: 1756

provided at those densities at the rear side of the substrate would make in the intensity of the illumination directed therethrough during the exposure process, based on said correlation, ascertaining the densities of the transparency-adjusting pattern features that correspond to said distribution of the degrees to which the intensity of the illumination needs to be decreased, to thereby obtain a distribution of the densities of the transparency-adjusting pattern features in relation to said localities, and providing the transparency-adjusting pattern features at the rear side of the substrate in an arrangement corresponding to said distribution of the densities of the transparency-adjusting pattern features.

Doany et al. teach mask for blocking a radiation beam directed thereon comprising: a radiation transmissive two-sided substrate having a back side disposed to be located facing toward a radiation beam source, a first patterned layer of radiation reflective material disposed on the front side of said substrate opposite said back side, said patterned layer of radiation reflective material having radiation transparent areas therein to permit radiation passing through said substrate to also pass through said patterned layer, and wherein said remainder of said patterned layer is composed of a pattern of said reflective material to reflect radiation passing through said substrate back through said substrate,

and a second patterned layer of radiation blocking material disposed on said back side of said substrate, said second patterned layer having radiation transparent areas therein at the same corresponding positions as said radiation transparent areas in said first layer of radiation reflective material on said front side of said substrate wherein said radiation transparent areas in said second patterned layer are larger than the said corresponding radiation transparent areas in said first patterned layer on said front side of said substrate, said second patterned layer functioning to reflect radiation prior to impinging on said back side of said substrate.

Art Unit: 1756

Therefore, Doany et al. teach the use of a second patterned layer of radiation blocking material disposed on said back side of said substrate. However, the reference does not teach the other limitations with respect to the transparency adjustment such as selecting transparency-adjusting pattern features that, if provided in a set at a rear side of the substrate of the photomask during the exposure process, would change the intensity of the illumination passing through the photomask during the exposure process due to the density of the features in terms of their size and spacing.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Stephen Rosasco whose telephone number is (571) 272-1389. The Examiner can normally be reached Monday-Friday, from 8:00 AM to 4:30 PM. The Examiner's supervisor, Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



S. Rosasco
Primary Examiner
Art Unit 1756

S. Rosasco
07/18/05